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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of :
Craig S. LaMoy et al : Docket No. NC79363A
Serial No: 10/021,682 :
Filed: November 30, 2001 : Group Art Unit: 1724
For: AIR SUPPLY SYSTEM PARTICULARLY : Examiner: F. M. Lawrence
SUITED TO REMOVE CONTAMINANTS :
CREATED BY CHEMICAL, BIOLOGICAL OR :
RADIOLOGICAL CONDITIONS :

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APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. §1.192

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant, within a four (4) month period from the March 4, 2003, filing date of the Notice of Appeal, and further to the concurrently filed Petition for an Extension of Time of Two Months, herein files an Appeal Brief drafted in accordance with the provisions of 37 C.F.R. § 1.192 (c) as follows:

I. REAL PARTY IN INTEREST

Appellants respectfully submit that the above-captioned application is assigned, in its entirety, to the United States of America, and administered by the Secretary of the Navy.

II. RELATED APPEALS AND INTERFERENCES

Appellants state that, upon information and belief, they are not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have any bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-19 are pending. The Application as filed included Claims 1 - 20. Appellants proposed cancelling claim 20 in the Amendment filed on January 13, 2003 (Certificate of Mailing dated January 6, 2003); claim 20 was cancelled responsive to the filing of a Notice of Appeal on March 4, 2003. Thus, claims 1-19 are on appeal and all rejections concerning claims 1-19 are herein being appealed.

IV. STATUS OF AMENDMENTS

A statement of the status of amendments filed subsequent to final rejection is detailed as follows:

Appellant's "AMENDMENT UNDER 37 C.F.R. § 1.116" (Paper No. 9), filed January 13, 2003 (Certificate of Mailing dated January 6, 2003), has been acted upon by the Examiner and treated in an "Advisory Action" (Paper No. 10), dated February 4, 2003, with the following effect: The Amendment will be entered for purposes of Appeal (claim 20 is cancelled). The Amendment did not overcome the rejection of claims 1-19.

V. SUMMARY OF THE INVENTION

The invention is directed to an air supply system that is particularly suited to filter out contaminants created by chemical, biological or radiological conditions. See page 2, lines 27-28 (page references refer to the Substitute Specification filed January 13, 2003).

The system comprises a three-stage air filter apparatus and a supply fan. The three-stage air filter apparatus has an input and an outlet, with the input fluidly coupled to the inlet of the air supply system. The three-stage air filter apparatus has first, second and third coaxially arranged annular filters, with the first filter being disposed within the second filter and the second filter being disposed within the third filter. The first filter is located closest to the input of the three-stage air filter apparatus and the third filter is located closest to the output of the three-stage air filter apparatus. The first filter filters and removes particles of at least a first size. The second filter filters and removes aerosols and particles of a size which is less than the first size. The third filter included a gas adsorber for removing gases. The air supply system has an input fluidly coupled to the output of a three-stage air filter apparatus and an output fluidly coupled to the air intake plenum of the protected zone. The supply fan supplies a sufficient flow of air so as to provide the protected zone with a positive pressure. See page 3, lines 1-12.

Fig. 1 is a block diagram showing the interrelationship of the essential elements making up the air supply system 10, which supplies an enclosed protected zone 12, having an air intake means 14, with an air supply having an inlet 16 that is coupled to the external environment. The system 10 removes contaminants created by chemical, biological or radiological conditions. See page 4, lines 3-10.

The protected zone 12 is pressurized by supplying air at a sufficient flow and maintaining the positive pressure by providing air tightness of the protected zone 12 itself and by the use of air locks. Maintaining a positive pressure with the protected zone 12 prevents the infiltration of chemical and biological contaminants, which are removed from the air flowing into the pressurized zone 12 by a three-stage air filter apparatus 18. See page 4, lines 17-21.

The three-stage air filter apparatus 18 has a first filter 20, a second filter 22, and a third filter 24, all of which are annular coaxially arranged filters. The first filter 20 is disposed within the second filter 22, and the second filter 22 is disposed within a third filter 24 as described below in reference to Fig. 2. The first filter 20 is physically located closest to the input of the three-stage air filter apparatus 18, and the third filter 24 is physically located closest to the output of the three-stage air filter apparatus 18. See page 4, lines 23-28.

A differential pressure gage 26 is connected between the input and the output of the three-stage air filter apparatus 18 and develops an output proportional to the difference in pressure across filter apparatus 18. The differential pressure gauge 26 permits verification of the operation of the three-stage air filter apparatus 18. See page 5, lines 1-6.

The air supply system 10 also includes a supply fan 28, which supplies a sufficient amount of air at a sufficient flow so as to provide the protected zone 12 with a positive pressure of 1.0 inches wg. The supply fan 28 is located on the downstream side of the three-stage filter apparatus 18 and cooling coils 30. See page 5, lines 8-13.

The cooling coils 30 are installed downstream of the three-stage filtering system 18 so as to condition (cool if warm) the supplied air before distributing it to the supply fan 28. See page 5, lines 15-26.

The protected zone 12 utilizes fan/natural exhaust equipment 34 to remove air from the protected zone 12 sufficient to provide and maintain the desired positive pressure within the protected zone 12 and zone pressure gages 36, which are monitored to ensure that the protected zone 12 is supplied with the desired positive pressure, e.g., about 0.5 inches (in) wg to about 1.5 inches (in) wg. See page 5, line 23 - page 6, line 2.

The alarm system 38 monitors the pressure in the protected zone 12 indicated by the zone pressure gauges 36 and provides an audible alarm to alert personnel of low pressure conditions therein. The alarm may be generated when the pressure within the protected zone 12 falls below 0.5 inches wg. See page 6, lines 4-8.

The protected zone 12 includes an opening with an input and an output, wherein a pressure control valve (PCV) 40 is installed. PCV 40 provides fluid communication between the input and output of the opening and is dimensioned to allow pressure control valve 40, which is used to relieve excess air from the protected zone 12 when the measured pressure for fluid communication therebetween when the positive pressure within a protective zone is greater than about 1.5 inches wg. See page 6, lines 10-17.

The air supplied into the protected zone 12 originates from inlet 16, that is preferably directed into a coarse-filter 42. The coarse-filter 42 typically uses a metal mesh to prevent large particles from entering the air supply system 10. The output of the coarse-filter 42 is directed into

a preheater 44, which conditions the air before it enters the three-stage air filter apparatus 18. See page 6, lines 19-25.

As seen in Fig. 2, the three filters 20, 22, and 24 of the three-stage air filter apparatus 18, already discussed with reference to Fig. 1, are annular in shape and coaxially arranged, with filter 20 being dimensioned to be insertable into filter 22 which, in turn, is dimensioned so as to be insertable into filter 24. The filters 20, 22, and 24 are radial flow types, wherein air enters the inner (filter 20) diameter area and flows radially outward through the larger (filter 24) diameter surface. It will be appreciated from Fig. 2 that filters 20, 22, and 24 are free-standing filters. The first filter 20 has a typical outer diameter of twelve (12) inches and has a typical length of 10 inches. The first filter is a pleated-medium which filters and removes particles of at least a first or relatively small size. The second filter 22 filters and removes aerosols and particulates of a size which is less than the first size of the particles being removed by the first filter 20. The second filter 22 is selected of a material, known in the art, for removing solid and aerosol chemical, biological and radiological contaminants. The third filter 24 comprises a gas adsorber which removes gases. The third filter 24 contains activated charcoal (asym-teda charcoal (chromium free)) selected, in a manner known in the art, for removing chemical warfare gases. See page 6, line 25 - page 7, line 12.

Fig. 3 illustrates one three-stage air filter apparatus 18 further having a gas cover 46 that is placed over the third filter 24 and a NEPA cover 48, which is placed over the second filter 22 and a clamp 52, which is over the third filter 20. The gas cover 46 and NEPA cover 48 are attached by a nut 50, whereas the third filter 20 is attached by way of a clamp 52 and a nut 54. It will be appreciated from Fig. 3 that the second and third filters 22, 24 are held in place by retaining

mechanisms, e.g., the gas cover 46 and the NEPA cover 48, while the first filter 20 is held relative to the second filter. See page 7, lines 14-20.

As shown in Fig. 4, the operation of the system 10 provides an adequate amount of air filtration of the air that is used to pressurize the protected zone 12 and monitors for and maintains the protected pressurized zone 12 at a positive pressure within a desired range, e.g., between 0.5-1.5 in. wg. See page 8, lines 12-15.

The air provided from inlet 16 is divided into three components, identified in Fig. 4 by three different streams 80, 82 and 84 that respectively represent particulates, aerosols, and gases. The three streams are first intercepted by the coarse-filter 42, which typically has dimensions of 19.5 by 29.5 inches. The coarse-filter 42 filters out large particulates and then directs the paths 80, 82 and 84 to the preheater 44, which elevates the air to a temperature of at least 42° F and having a relative humidity of about 70%. The preheater 44 is preferably controlled by a thermostat 86. The preheater 44 directs the three streams 80, 82 and 84 to the first filter 20. See page 8, lines 17-26.

The first filter 20 removes relatively large particles and then directs the paths 80, 82 and 84 to the second filter 22. The second filter 22 removes fine particulates and aerosols of 0.3 microns or greater with efficiencies of greater than 99.97 from its received air and delivers an output which only comprises gases that are directed to the third filter 24. The third filter 24 removes the gas by an adsorption operation and passes air free, indicated by directional arrow 88, from the contaminants, especially those created by unwanted chemical, biological and radiological conditions, that is directed to the outlet plenum 58 which, in turn, direct the air 88, free from contaminants, to the cooling coils 30. See page 8, line 28, - page 9, line 8.

The cooling coils 30, in response to the thermostat 74, supplies the same air 88 free from contaminants to the supply fan 28 which, in turn, provides filtered air 88 free of contaminants into the protected zone 12. The protected zone 12 is maintained by means of the pressure transducers 36 and its related alarm system 38 as well as the pressure control valves 40 and is supplied with a continuous flow air 88 free from contaminants. See page 9, lines 10-16.

VI. ISSUES

1. Whether each of claims 1, 3, 10, 11, and 18-19 is unpatentable under 35 U.S.C. §103(a)¹ as being unpatentable over Linnersten et al. (U.S. Patent No. 6,152,996) in view of Thomaides et al. (U.S. Patent No. 4,838,903)?
2. Whether each of claims 2 and 12 is unpatentable under 35 U.S.C. §103(a) as being unpatentable over Linnersten et al. (U.S. Patent No. 6,152,996) in view of Thomaides et al. (U.S. Patent No. 4,838,903) and further in view of Berghout et al. (U.S. Patent No. 3,218,997)?
3. Whether each of claims 4, 5, 13, and 14 is unpatentable under 35 U.S.C. §103(a) as being unpatentable over Linnersten et al. (U.S. Patent No. 6,152,996) in view of Thomaides et al. (U.S. Patent No. 4,838,903) and further in view of Repp et al (U.S. Patent No. 4,962,371)?
4. Whether each of claims 6 and 15 is unpatentable under 35 U.S.C. §103(a) as being unpatentable over Linnersten et al. (U.S. Patent No. 6,152,996) in view of Thomaides et al. (U.S. Patent No. 4,838,903) and further in view of Frawley et al (U.S. Patent No. 5,327,744)?

¹ Appellants are on record that the stated rejection is wholly improper, since the Final Office Action relies on references not stated in the rejection. See M.P.E.P. § 706.02(j), which states that:

Where a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection. See In re Hoch, 57 CCPA 1292, 428 F.2d 1341, 166 U.S.P.Q. 406, footnote 3 (1970).

For example, The Final Office Action rejects claims 1, 3, 10, 11, and 18-19 as being obvious in view of the combination of Linnersten et al. (the '996 patent) in view of Thomaides et al. (the '903 patent). However, the discussion cites to Repp et al. ('371) and Frawley et al. ('744) as showing that an overpressure is an inherent and necessary feature of systems used to regulate airflow in military type closed cabins to prevent the influx of chemical, nuclear and biological agents.

5. Whether each of claims 7-9, 16, and 17 is unpatentable under 35 U.S.C. §103(a) as being unpatentable over Linnersten et al. (U.S. Patent No. 6,152,996) in view of Thomaidēs et al. (U.S. Patent No. 4,838,903) and further in view of You et al. (U.S. Patent No. 5,890,367)?

VII. GROUPING OF CLAIMS

Appellants hereby state that claims 1-19 stand or fall together.

VIII. ARGUMENTS

In the "final" action mailed April 26, 2002, the Examiner provided the following statements in support of the rejection of all pending claims under 35 U.S.C. §103(a):

1. The Final Office Action rejected claims 1, 3, 10, 11 and 18-19 under 35 U.S.C. 103(a) as being unpatentable over Linnersten et al. (6,152,996) in view of Thomaidēs et al. (4,838,903). [Citations omitted.]

The Final Office Action states that the '996 patent discloses a filter ventilation system that can be used in existing compressed air systems that use a blower to supply a closed cabin, such as those used in military applications, comprising a concentric cylindrical air filter that includes an outer prefilter (15) for removing coarse particulates, a filter support screen (14) within the prefilter, a HEPA or ULPA filter (13) within the screen for removing up to 99.9999% of particulates at 0.12 micron, and a bed of carbon (12) within the HEPA or ULPA filter for adsorbing gases such as ammonia. The '996 patent also discloses that the filter layers can be separately retained and are removable for cleaning or replacement, and that the filters can be arranged for air flow in the opposite direction, i.e., entering the air cleaner along its axis and flowing radially outwardly through the layers with the particulate filter located inside of the sorbent filter.

The Final Office Action then states that the presence of a blower to supply the closed cabin inherently anticipates a blower that is fluidly or pneumatically coupled to any part of the air-flow circuit, as recited in the claims. The cited references to Repp et al. ('371) and Frawley et al. ('744) each show that an overpressure is an inherent and necessary feature of such systems used to regulate airflow in military type closed cabins where the influx of chemical, nuclear and biological agents is prevented.

The Final Office Action admits that the instant claims differ from the disclosure of the '996 patent in that the arrangement of the filter layers are such that the prefilter is located within the second filter, that a pressure is provided from 0.5-1.5 in wg, and that a plenum and blower couples the downstream side of the filter with the protected zone. The '903 patent is cited as correcting these deficiencies.

According to the Final Office Action, the '903 patent discloses a filter for removing aerosols and small particulates from air comprising multiple concentric layers that can be oriented orderly in any way so that air can flow inwardly or outwardly. Also disclosed is a conduit for conducting the exit flow of multiple filters. Moreover, the Final Office Action opines that it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the system taught by the '996 patent to include mounting of the filter in any suitable configuration governed by space constraints and the arrangement of the filter inlet and outlet and to use a plenum where multiple filters are used in parallel, such as in high-flow operations that could not be accommodated by a single filter assembly. The absolute pressure maintained within the enclosed space would have been obvious to one skilled in the art as determined by the desired efficiency of the system required, and it is submitted that a blower can be placed in any suitable place in the gas supply line for providing a pressure differential sufficient to generate a positive flow into and out of the filter assembly.

2. Furthermore, the Final Office Action rejects claims 2 and 12 under 35 U.S.C. 103(a) as being unpatentable over the '996 patent in view of the '903 patent, as applied to claims 1 and 11 above, and further in view of Berghout et al. (3,218,997).

The combination of the '996 patent and '903 patent allegedly disclose all of the limitations of the claims except that a differential transducer is connected to the filter for showing an output proportional to the pressure sensed. The '997 patent is cited as providing this teaching. The '997 patent is cited as disclosing an exhaust filter for gas in a radioactive material incinerator comprising pressure gages on either side of the filter for indicating the amount of pressure on the filter to show if it is plugged.

The Final Office Action opines that it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the system taught by combination of the '996 patent

in view of the '903 patent to include a filter differential transducer in order to show blockage of the filter so that it can be cleaned or replaced before efficiency is greatly reduced.

3. Next, the Final Office Action rejects claims 4, 5, 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over the '996 patent in view of the '903 patent, as applied to claims 1 and 11 above, and further in view of Repp et al. (4,962,371).

The Final Office Action alleges that the combination of the '996 and the '903 patents disclose all of the limitations of the claims as discussed above except that the enclosed area is maintained at 0.5-1.5 in wg and uses a transducer to measure pressure in the area and produce an alarm signal when the pressure drops below about 0.5 in wg. Repp et al. is cited as supplying the missing teaching. According to the Final Office Action, the '371 patent discloses a system for maintaining a pressure of greater than 0.4 in wg in a shipboard protected zone by measuring with a transducer and producing an output voltage proportional to zone overpressure with signal lights for notification.

Again, the Final Office Action opines that it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the suggested combination of the '996 patent and the '903 patent by including a transducer for maintaining a preferred pressure in the protected area with an indicator light in order to notify users of a drop in pressure so that maintenance repairs can be made before potentially harmful substances can intrude the area.

4. The Final Office Action states that claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linnersten et al. ('996) in view of Thomaides et al. ('903) as applied to claims 1 and 11 above, and further in view of Frawley et al. (5,327,744; abstract; col. 1, lines 34-42; col. 8, lines 15-30). Allegedly, the combination of the '996 patent and the '903 patent disclose all of the limitations of the claims as discussed above except that a pressure control valve is used to allow flow out of the enclosed area when pressure is greater than about 1.5 in wg. Frawley et al. ('744) is cited as disclosing a filter system for maintaining a pressurized environment in military aircraft for protection against chemical, biological, or nuclear hazards, comprising a pressure control valve (52) for relieving excessive cockpit cooling airflow.

Once again, the Final Office Action opines that it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the system collectively taught by the '996

patent in combination with the '903 patent by using a pressure control valve to relieve an over-pressure in order to protect an enclosed area from being pressurized beyond a comfort zone for inhabitants and to prevent damage to components from internal pressure. The Final Office Action goes on to state that, absent a proper showing of criticality or unexpected results, the preferred maximum pressure is considered to be a parameter that would have been routinely optimized by one having ordinary skill in the art so that the enclosed area is protected from external contamination without excessive pressurization.

5. Finally, the Final Office Action rejects claims 7-9, 16 and 17 under 35 U.S.C. 103(a) as being unpatentable over the combination of the '996 patent and the '903 patent, as applied to claims 1 and 11 above, and further in view of You et al. (5,890,367).

In the view of the Final Office Action, the '996, '903 patent combination discloses all of the limitations of the claims as discussed above except for a coarse prefilter and heater disposed upstream of the 3-layer filter and cooling coils disposed downstream of the 3-layer filter. The '367 patent is cited as correcting the deficiencies in the combination. According to the Final Office Action, the '367 patent discloses a filter system for a clean room comprising a series of air conditioners and filters located upstream and downstream of heaters and coolers and an air-blowing fan for the treatment of outside air for use in the room. The Final Office Action alleges that it would have been obvious to one having ordinary skill in the art at the time of the invention to heat or cool the air flow of a protected room in order to control humidity and temperature of the air for the comfort of people using the room. Absent a proper showing of criticality or unexpected results, the preferred temperature and humidity of the air are considered to be parameters which would have been routinely optimized by one having ordinary skill in the art based on the desired comfort temperature of the users.

Appellants respectfully request that the Board reverse the Examiner's final rejection of claims 1-19 under 35 U.S.C. §103(a).

THE CITED PRIOR ART (PRIMARY AND SECONDARY)

U.S. Patent No. 6,152,996 to Linnersten et al. teaches an air cleaner element having incorporated sorption element, which includes a housing having a gas inlet and a gas outlet with a gas stream formed therebetween. An immobilized mass of sorption material formed in a desired shape is mounted in the housing and a particulate filter layer is mounted in the housing adjacent to the mass, with the particulate filter layer being mounted upstream of the sorption material mass. The air cleaner element can be used as a replacement to existing filter elements to provide sorption and particulate filtering to air circulation systems such as cabin air filter systems. See Abstract and Fig. 1. The term fan does not appear in the '996 patent. While one occurrence of "blower" is found in the patent, the term is used as follows: "The air cleaner element of the present invention can be designed to fit existing housing configurations, thus eliminating the need for modification to various components of the air handling system, such as the blower or motor." Thus, the '996 patent is completely neutral with respect to an undisclosed blower.

U.S. Patent No. 4,838,903 to Thomaides et al. teaches a multi-phase thick-bed filter having a main filter element the primary function of which is to remove aerosols from a moving gas stream and having an associated, readily removable upstream pre-filter element designed to remove solid particulate matter from the gas stream before its impingement on the main filter. See the Abstract. As discussed more fully below, the filter taught by the '903 patent is actually a sock, which is generally disposed in the exhaust of, for example, a chemical reactor.

THE CLAIMS ON APPEAL ARE NOT UNPATENTABLE UNDER 35 U.S.C. § 103(a)

It is well settled that 35 U.S.C. §103 authorizes a rejection where to meet the claim, it is necessary to modify a single reference or to combine it with one or more other references. After indicating that the rejection is under 35 U.S.C. §103, the Examiner should set forth in the Office action (1) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate, (2) the difference or differences in the claim over the applied reference(s), (3) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and (4) an explanation why such proposed

modification would have been obvious to one of ordinary skill in the art at the time the invention was made. See M.P.E.P. §706.02(j).

Appellants submit that the Final Office Action has again failed to forth a "prima facie" case of obviousness, since the Final Office Action has failed to either consider the teachings *of all of the cited references*, as required by Item (2), or to provide any motivation, as required by Item (4). In other words, the Final Office Action identifies multiple deficiencies in the teachings of the primary reference, i.e., the '996 patent, and then fails to rectify these deficiencies with any teachings from the secondary references.

Before discussing these points, Appellants submit the following prefatory discussion regarding the Final Office Action's failure to set for a "prima facie" case of obviousness under well defined principles of examination practice and case law.

The test of obviousness *vel non* is statutory. It requires that one compare the claim's "subject matter as a whole" with the prior art "to which said subject matter pertains." 35 U.S.C. §103. The inquiry is highly fact-specific by design. Appellants are entitled to issuance of an otherwise proper patent unless the PTO establishes that the invention *as claimed* in the application is obvious over cited prior art, based on the specific comparison of that prior art with claim limitations. When the references cited by the examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. See In re Fine, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

In addition, the concept of *prima facie* obviousness is not a segmented concept; the decision-maker must start over when rebuttal evidence is submitted after *prima facie* obviousness is established (which is decidedly not the case here); the question of whether Applicants' burden of going forward to rebut an entire path to a decision must be retraced; the earlier decision should not be considered as set in concrete and the Applicant's rebuttal evidence evaluated only on its knockdown ability; *prima facie* obviousness is a legal conclusion, not fact; facts established by rebuttal evidence must be evaluated along with the facts on which the earlier conclusion was reached, not against the conclusion itself...In re Rhinehart, 189 U.S.P.Q. 143 (CCPA 1976).

It is also well settled that the standard of teaching required of a prior art reference to support a 35 U.S.C. §103 rejection is substantially more than to support a 35 U.S.C. §102 rejection of

anticipation, since the Doctrine of Inherency does not extend beyond anticipation. In other words, it is harder to make out a “prima facie” case of obviousness because the Examiner is precluded from holding that a feature, limitation, or arrangement is inherent in a particular system or mechanism. Thus, inherency of an advantage and its obviousness are different questions; that which may be inherent is not necessarily known; obviousness cannot be predicated on that which is unknown. In re Adams, 53 CCPA 996, 356 F.2d 998, 148 U.S.P.Q. 742 (1966).

Furthermore, inherency and obviousness are distinct concepts. In re Rinehart, 531 F.2d 1048, 189 U.S.P.Q. 143 (CCPA 1976). A retrospective view of inherency is not a substitute for some teaching or suggestion that supports the selection and use of the elements in the particular claimed combination. In deciding that a novel combination would have been obvious, there must be a supporting teaching in the prior art; for that which may be inherent is not necessarily known, and obviousness cannot be predicated on what is unknown. See M.P.E.P. § 2143, citing In re Newell, 13 U.S.P.Q.2d 1248, 1250 (Fed. Cir. 1989).

In any event, although the Final Office Action repeatedly employs the term “inherently anticipated” in rejecting the claims, it is respectfully submitted that these assertions are meaningless. First, the stated rejections are under 35 U.S.C. §103, not 35 U.S.C. §102. Second, the Final Office Action is employing the term to signify that one of ordinary skill in the art has the requisite skill to modify one or more of the applied references, and not to signify that, for example, the filter assembly taught by the ‘996 patent necessarily employs a blower in the configuration recited in claims 1, 11, and 18, necessity being the indispensable criteria of inherency. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. See M.P.E.P. § 2143, citing In re Mills, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). Moreover, a statement that modifications of the prior art to meet the claimed invention would have been “well within the ordinary skill of the art at the time the claimed invention was made” because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the

references. See M.P.E.P. § 2143, citing Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993).

Appellants respectfully submit that the statement in paragraph 9 of the Final Office Action is statement regarding skill level of one of ordinary skill in the art rather than a statement of motivation, since substantially all of the suggested modifications to the '996 patent are absent from the other applied references.

Turning again to the substantive issues, Appellants again submit that the Final Office Action has again failed to forth a "prima facie" case of obviousness, since the Final Office Action has failed to either consider the teachings *of all of the cited references*, as required by Item (2), or to provide any motivation, as required by Item (4). In other words, the Final Office Action identifies multiple deficiencies in the teachings of the primary reference, i.e., the '996 patent, and then fails to rectify these deficiencies with any teachings from the secondary references.

For example, the Final Office Action states that the '996 patent teaches that the filters can be arranged for air flow in the opposite direction [i.e.], entering the air cleaner along its axis through the layers of the particulate filter located inside of the sorbent filter. The Final Office Action then admits that the instant claims differ from the teachings of the '996 patent in the arrangement of the filter layers such that the pre-filter is located within the second filter. It should be noted that the pre-filter 15 (215, 315) is a durable non-pleated outer wrap supported by a screen 14 (214, 314), which screen is disposed on the outside of the filters taught by the '996 patent. There is simply no teaching within the four corners of the '996 patent that permits the pre-filter 15 (215, 315) to be disposed within the HEPA filter 13 (213, 313).

Moreover, as stated in the Amendment of July 26, 2002, the '903 patent positively teaches away from the arrangement at column 3, lines 26-31, wherein the '903 patent teaches that "sock," i.e., unsupported filters, cannot be employed in systems where the flow is directed radially outward through the pre-filter and filter, respectively.

From the discussion above, it will be seen that, at best, there is a conflict between the teachings of the references and, at worst, the references teach away from one another. With respect to the latter, it is respectfully submitted that one of ordinary skill in the art, following the guidance

found in the '996 and '903 patents, would be led in a direction divergent from the path that was taken by the Appellants because the '996 patent does not teach Appellants claimed arrangement and because the '903 patent teaches away from modification of the '996 patent suggested in the Final Office Action. Since a reference which teaches away is a significant factor in determining obviousness, the nature of that teaching is highly relevant and must be considered. See In re Gurley, 31 U.S.P.Q.2d 1130 (Fed. Cir. 1994). The Examiner's analysis gives no weight to the teachings in the applied references which contradict the Examiner's position. This selective view of the '996 and '903 patents allow the Examiner to focus on elements described in expansive statements in the '996 patent while ignoring the fact that the '903 patent indicates the Final Office Action's filter arrangement is unworkable.

In the context of conflicting teachings, it is respectfully submitted that the '996 patent and the '903 patent are in conflict on multiple levels. For example, the '996 patent teaches a three-stage filter 10, where one stage is pleated paper and one stage is an immobilized mass of sorption material; the pre-filter appears to be cloth or foam material. In contrast, the '903 patent teaches filters and pre-filters comprising loosely packed fibers, which the '903 patent touts as being the most effective type of filters. Compare column 3, lines 3-45, of the '996 patent and column, lines 32-50, and column 4, lines 27-34, of the '903 patent. Thus the '996 and the '903 patents are in conflict both with respect to filter construction and filter materials.

It is well settled that the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art must be considered to the extent that they are in analogous arts. Where the teachings of two or more prior art references conflict, the Examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. See M.P.E.P. § 2143, citing In re Young, 18 U.S.P.Q.2d 1089 (Fed. Cir. 1991).

Moreover, it is again submitted that the '903 patent is drawn from non-analogous art. The test for analogous or non-analogous art is set forth in In re Wood and Eversole, 599 F.2d 1032, 202 U.S.P.Q. 171 (CCPA 1979) as follows:

In resolving the question of obviousness under 35 U.S.C. 103, we presume full knowledge by the inventor of all the prior art in the field of his endeavor. However, with regard to prior art outside the field of his endeavor, we only presume knowledge from those arts reasonably pertinent to the particular problem with which the inventor was involved. In re Antle, 58 CCPA 1382, 1387, 444 F.2d 1168, 1171-72, 170 U.S.P.Q. 285, 287-88 (1971). The rationale behind this rule precluding rejections based on combination of teachings of references from non-analogous arts is the realization that an inventor could not possibly be aware of every teaching in every art. Thus, we attempt to more closely approximate the reality of the circumstances surrounding the making of an invention by only presuming knowledge by the inventor of prior art in the field of his endeavor and in analogous arts.

....

The determination that a reference is from a non-analogous art is therefore twofold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

It should be clearly understood that "analogous art" is always determined with respect to the claimed invention, i.e., the "system for supplying an enclosed protected zone having air intake means with an air supply having an inlet and that is filtered to remove contaminants created by chemical, biological or radiological conditions" recited in claim 1, the corresponding method recited in claim 11, and the "system for supplying an enclosed protected zone with air cleaned of chemical, biological, and radiological contaminants at a flow rate sufficient to maintain a positive pressure within the protected zone" recited in claim 18. In contrast, the '903 patent a multi-phase thick bed filter disposed in the discharge path of a reactor or pressure vessel for keeping effluent vapors from escaping, for example, to atmosphere. Moreover, since the '903 patent clearly and definitively states that the filters actually taught by the '903 patent cannot be employed in the manner suggested by the Final Office Action, the '903 would never have been considered by one of ordinary skill in the art as teaching anything pertinent to the problem addressed by the Appellants.

In short, with respect to Item (2) of a "prima facie" case of obviousness, it is respectfully submitted that the analysis of the references is wholly inadequate to support a combination of the

references, because the secondary reference teaches away from the primary reference and the secondary reference is drawn from non-analogous art. Since the Final Office Action does not even recognize the conflict between these references, the Final Office Action fails to provide a “prima facie” case of obviousness.

With respect to Item (3), the Final Office Action fails to identify the specific combination of elements taught by the references needed to obviate the invention recited in claim 1. More specifically, the Final Office Action has not even attempted to identify where one of the applied references teaches “a supply fan having an input fluidly coupled to said output of said three-stage air filter apparatus and an output fluidly coupled to said air intake means of said protected zone, said supply fan supplying an air at a sufficient enough flow so as to provide said protected zone with a positive pressure,” as recited in claim 1. In fact, the Final Office Action apparently has selected references that are, at best, neutral with respect to fans or blowers. For example, the multistage filter taught by the ‘996 patent is described as suitable for aircraft ventilation, compressed air systems, and personal respirators. See column 2, lines 4-13 of the ‘996 patent. The ‘996 patent also states that the “air cleaner element of the present invention can be designed to fit existing housing configurations, thus eliminating the need for modification to various components of the air handling system, such as the blower or motor,” which is the only time that the word blower is employed in the reference.

It will be appreciated that the only one of the applied references that actually teaches a supply fan disposed upstream of a pressurized compartment, i.e., the people tank, is the ‘744 patent, which teaches away from the filters taught by the primary and secondary references.

As previously mentioned, the two-stage filter taught by the ‘903 patent does not employ a pump, fan, or blower at all. It will be appreciated by one of ordinary skill in the art that the repeated references to “candles” instead of filters, to “gas stream” and “processed gas,” and to “treatment vessel 26” indicates that the ‘903 patent teaches a specific filter system employed in the top of a reactor vessel. In virtually all such applications, the reactor vessel pressure provides sufficient head for the operation of the two-stage filter taught by the ‘903 patent. In other words, the ‘903 patent teaches away from the use of the supply fan recited in claim 1.

Turning now to Item (4), the Final Office Action contains a tacit admission that neither of the applied references teach or even suggest the recited supply fan. More specifically, the Final Office Action states that:

“It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the system of Linnersten et al. ('996) to include mounting of the filter in any suitable configuration governed by space constraints and the arrangement of the filter inlet and outlet and to use a plenum where multiple filters are used in parallel, such as in high-flow operations that could not be accommodated by a single filter assembly. The absolute pressure maintained within the enclosed space would have been obvious to one skilled in the art as determined by the desired efficiency of the system required, and it is submitted that a blower can be placed in any suitable place in the gas supply line for providing a pressure differential sufficient to [generate] a positive flow into and out of the filter assembly.”

Since the Final Office Action has failed to point out the location of a teaching or suggestion of, for example, the supply fan positively recited in claim 1 within the four corners of either of the primary or secondary references, there is no motivation, absent impermissible hindsight, for adding the claimed supply fan to the filters actually taught be either one of these applied references to create the system actually recited in independent claim 1. **The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.** See M.P.E.P. §2143, citing In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Moreover, the statement quoted above from the Final Office Action fails to provide any reasoning, much less cogent reasoning, as to why one of ordinary skill in the art would be motivated to provide the claimed system and corresponding method. Motivation normally addresses “**why**” the combination would be made; the Final Office Action merely indicates that one of ordinary skill in the art **could** provide the claimed system once the multistage filter taught by the '996 patent, as modified by a single, isolated teaching from the '903 patent, were available to him/her. It is again submitted that the Final Office Action merely indicates that one of ordinary skill in the art would be able to produce the system recited in claim 1 given the three-stage filter taught by the '996 patent while ignoring the facts that (1) the principal teaching of the '903 patent is a two-stage filter and (2)

the candles taught by the '903 patent are not associated with any sort of blower. Thus, the Final Office Action fails to set forth a prima facie case of obviousness.

In short, since the '903 patent teaches away from the arrangement of the filters taught by the '996 patent, the Final Office Action has not set forth a "prima facie" case of obviousness. Moreover, since neither of the applied references teach the supply fan positively recited in claim 1, and since many of the specific applications of the filters taught by the applied references do not employ fans of any type, no possible combination of the applied references, either alone or in combination, could teach a system containing a supply fan. Thus, there is a second, independent reason for asserting that the Final Office Action has failed to set forth a "prima facie" case of obviousness.

Even assuming arguendo that the '744 patent is employed in the combination employed in rejecting claims 1, 11, 18, the Final Office Action is not free to extract the blower taught by the reference while ignoring the teaching of this reference, i.e., the fact that the '744 patent teaches away from both the invention recited in claims 1, 11, and 18 and the invention actually taught by the '996 patent, as discussed in greater detail below.

Moreover, it is well settled that, during examination, it is axiomatic that not only must claims be given their broadest reasonable interpretation consistent with the specification, but also all limitations must be considered. The characterization of certain limitations or parameters as obvious does not make the claimed invention, considered as a whole, obvious. See Ex parte Peterson, 228 U.S.P.Q. 216, 217 (Pat. Off. Bd. App. and Inter. 1985). Appellants respectfully submit that terms found in a claim may not be ignored and that all words in a claim must be considered in evaluating patentability over the prior art. Stated another way, since the Final Office Action has not addressed expressly recited limitations of claims 1 and 11, e.g., "a supply fan having an input fluidly coupled to said output of said three-stage air filter apparatus and **an output fluidly coupled to said air intake means of said protected zone**, said supply fan supplying an air at a sufficient enough flow **so as to provide said protected zone with a positive pressure**," the Final Office Action cannot, and has not, set forth a "prima facie" case of obviousness. The Final Office Action merely states "the absolute pressure maintained within the enclosed space would have been obvious to one of

ordinary skill in the art;” such conclusory statements cannot avoid the cogent arguments necessary to a “prima facie” case of obviousness.

Finally, and in any event, the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art must be considered to the extent that they are in analogous arts. Where the teachings of two or more prior art references conflict, the Examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. See M.P.E.P. § 2143, citing In re Young, 18 U.S.P.Q.2d 1089 (Fed. Cir. 1991). Thus, it is the teachings of the prior art as a whole that determine whether an invention is obvious. The Final Office Action cannot simply either ignore a reference that teaches away from the claimed invention or extract isolated teachings from a reference while ignoring what the reference “as a whole” would teach to one of ordinary skill in the art. For example, when considering the problem that the above-identified application addresses, given the ‘966, the ‘903 patents actually applied in rejecting claims 1 and 11, and given the patent to Frawley et al. (U.S. Patent No. 5,327,744; of record), one of ordinary skill in the art would have merely adapted the teachings of the ‘744 patent to shipboard or land based applications and ignored the teachings of the ‘996 and the ‘903 patents as being completely superfluous. One of ordinary skill in the art would also appreciate that the ‘744 patent teaches away from the claimed invention by its teaching of a pressurized system, i.e., a blower of some description, disposed upstream of a HEPA filter 32 and a pair of parallel regenerative bed filters 32-1 and 34-2.

It is again submitted that the Final Office Action cannot develop a “prima facie” case of obviousness by ignoring or selectively applying a reference that clearly teaches away from both the claimed invention and the references actually applied in rejecting the claimed invention as obvious.

For all of the reasons set forth above, Appellants respectfully submit that the Examiner has failed to set for a “prima facie” case of obviousness. For that reasons, the Board is respectfully requested to overturn the 35 U.S.C. §103(a) rejection of claims 1, 11 and 18 set forth in the Final Office Action. Appellants further submit that claims 3, 10, depending from independent claim 1, are

allowable for all of the reasons given with respect to claim 1. Claim 19, depending from independent claim 18, is likewise allowable for all of the reasons given with respect to claim 18.

The Final Office Action rejects 2 and 12 under 35 U.S.C. §103(a) as being unpatentable over the '996 patent in view of the '903 patent, as applied to claims 1 and 11, and further in view of Berghou et al. (U.S. Patent No.3,218,997). This rejection is respectfully traversed.

It is respectfully submitted that if the Final Office Action has failed to set forth a "prima facie" case of obviousness with respect to claims 1 and 11 before the '997 patent is added to the combination, it certainly cannot establish the rationale supporting an obviousness rejection once the '997 is included in the combination. The '997 patent teaches a system wherein a dynamic precipitator 44, i.e., a rotary blower type precipitator operating a 1200 r.p.m. at a flow rate of 4,000 c.f.m. and developing a total head of 5 inches of pressure, is disposed upstream of the filter assembly 53. See Fig.1 and column 3, lines 1-5. Thus, the '997 patent clearly teaches away from the specific arrangement of a supply fan recited in claims 1 and 11.

Moreover, Appellants submit that one of ordinary skill in the art would not have attempted to extract any teachings from the '997 patent, since the '997 patent teaches a system that would preferably operate at a negative pressure in order to minimize the spread of radioactive contamination. In any event, the filter system taught by the '997 patent, while a three stage system, employs a water spray to remove ash fines, a rotary precipitator, and a ceramic filter assembly. Thus, the tertiary reference conflicts with the primary and secondary references.

Since the applied references fail to set forth a "prima facie" case of obviousness with respect to independent claims 1 and 11, the combination of references cannot render dependent claims 2 and 12, depending respectively therefrom, obvious. For that reasons, the Board is also respectfully requested to overturn the 35 U.S.C. §103(a) rejection of claims 2 and 12.

The Final Office Action also rejects claims 4, 5, 13, and 14 under 35 U.S.C. §103(a) as being unpatentable over the '996 patent in view of the '903 patent, and further in view of Repp et al (U.S. Patent No. 4,962,371). This rejection is again traversed.

More specifically, since the Final Office Action has failed to set forth a "prima facie" case of obviousness with respect to claims 1 and 11 before the '371 patent is added to the combination,

it certainly cannot establish the rationale supporting an obviousness rejection once the '371 is included in the combination. In other words, since the '371 patent is not cited as correcting, and does not correct, the deficiencies discussed above with respect to the combination of the '996 and '903 patents, the proposed combination of references cannot render the invention recited in claims 1 and 11 obvious. Claims 4 and 5, depending from claim 1, are allowable for all of the reasons given with respect to claim 1. Moreover, claims 13 and 14, depending from independent claim 11, are allowable for all of the reasons set forth with respect to claims 1 and 11.

Moreover, the Final Office Action rejects claims 6 and 15 under 35 U.S.C. §103(a) as being unpatentable over the '996 patent in view of the '903 patent, and further in view of the '744 patent (discussed above). This rejection is also traversed. More specifically, since the Final Office Action has failed to set forth a "prima facie" case of obviousness with respect to claims 1 and 11 before the '744 patent is added to the combination, it certainly cannot establish the rationale supporting an obviousness rejection once the '744 patent is included in the combination. Moreover, since the '744 patent clearly teaches away from the claimed invention, the combination cannot possibly teach or suggest the system recited in claim 1 or the corresponding method recited in claim 11. Moreover, since the '744 patent is not cited as correcting, and clearly does not correct, the deficiencies discussed above with respect to the asserted combination of the '996 and '903 patents, the proposed combination of reference cannot render the invention recited in claims 1 and 11 obvious. Claims 6 and 15, depending respectively from claims 1 and 11, are allowable for all of the reasons given with respect to independent claims 1 and 11.

Finally, the Final Office Action rejects claims 7-9, 16, and 17 under 35 U.S.C. §103(a) as being unpatentable over the '996 patent in view of the '903 patent, and further in view of the You et al. (U.S. Patent No. 5,890,367). This rejection is again traversed.

First, since the Final Office Action has failed to set forth a "prima facie" case of obviousness with respect to claims 1 and 11 before the '367 patent is added to the combination, it certainly cannot establish the rationale supporting an obviousness rejection once the '367 patent is included in the combination. Moreover, since the '367 patent clearly teaches away from the claimed invention by teaching locating particulate filters 1c and 1d upstream of a fan 1i and locating HEPA filter 1h

and chemical filter downstream of the fan 1i (see Fig. 3 and column 4, lines 32-44), the combination cannot possibly teach or suggest the system recited in claim 1 or the corresponding method recited in claim 11.

Furthermore, since the '367 patent is not cited as correcting, and clearly does not correct, the deficiencies discussed above with respect to the asserted combination of the '996 and '903 patents, the proposed combination of reference cannot render the invention recited in claims 1 and 11 obvious. Claims 7-9 and claims 16 and 17, depending respectively from claims 1 and 11, are allowable for all of the reasons given with respect to independent claims 1 and 11.

Thus, Appellants respectfully submit that the Examiner has not even made out a prima facie case of obviousness under 35 U.S.C. §103(a) regarding any of pending claims 1-19.

For all the foregoing reasons, it is respectfully submitted that claims 1-19 (all the claims presently in the application) are patentable and that this application is otherwise in condition for allowance. It is, therefore, respectfully requested that the standing rejection be reversed and the application be passed to issue at the earliest possible time.

SUMMARY

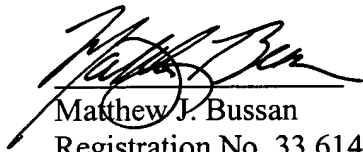
In summary, then, Appellants respectfully request the Board to reverse the rejection of all the appealed claims and to find each of these claims allowable for defining subject matter which would not have been obvious under 35 U.S.C. §103(a) at the time such subject matter was invented.

This Brief is being submitted in triplicate, and authorization for payment of the required Brief fee is contained in the cover letter for this Brief. Please charge any fee (excluding the Issue Fee) that may be necessary for the continued pendency of this application to our Deposit Account No. 50-0967.

Note: For convenience of detachment without disturbing the integrity of a remainder of pages of this Appeal Brief, Appellant's "APPENDIX" section is contained on separate appendix sheets following a signatory portion of this Appeal Brief.

Appellants will delay a final decision on oral argument until after review of the Examiner's Answer.

Respectfully submitted,


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Attachment(s):

Appendix Containing Pending Claims 1-19

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APPENDIX

1. A system for supplying an enclosed protected zone having air intake means with supply having an inlet and that is filtered to remove contaminates created by chemical, biological or radiological conditions, said system comprising:

a) a three-stage air filter apparatus having an input fluidly coupled to said inlet and having an input, said three-stage air filter apparatus having a first, second and third coaxially arranged annular filters, with the first filter being disposed within the second filter and the second filter being disposed within the third filter, and with the first filter being positioned closest to said input and the third filter being positioned closest to said output, said first filter filtering and removing particulates of at least a first size, said second filter filtering and removing aerosols and particulates of a size which is less than said first size, and said third filter comprising a gas adsorber for removing gases; and

b) a supply fan having an input fluidly coupled to said output of said three-stage air filter apparatus and an output fluidly coupled to said air intake means of said protected zone, said supply fan supplying an air at a sufficient enough flow so as to provide said protected zone with a positive pressure.

2. The system according to claim 1, further comprising at least one differential transducer connected between the input and output of the said three-stage air filter apparatus and delivering an output proportional to the difference between the pressure sensed therebetween.

3. The system according to claim 1, wherein said positive pressure of said protected zone is within the range from about 0.5 in wg to about 1.5 in wg.

4. The system according to claim 3, further comprising a transducer connected within said protected zone and delivering an output proportional to the pressure sensed within said protected zone.

5. The system according to claim 4, further comprising an alarm device connected to receive the output of said transducer and generating an alarm signal when said output of said transducer is representative of a pressure of below about 0.5 in. wg.

6. The system according to claim 3, wherein said protected zone has an opening with an input and an output and wherein said system further comprises a pressure control valve (PCV) fluidly coupled between the input and output of said opening of said protected zone and is dimensioned so as to allow for fluid communication between said input and output when the positive pressure within said protected zone is greater than about 1.5 in wg.

7. The system according to claim 1, further comprising a coarse filter interposed between said inlet of said supply fan and said input of said three-stage air filter apparatus, said coarse filter filtering and removing particulates having a size which is greater than said first size.

8. The system according to claim 7, further comprising a heater interposed between said coarse filter and said input to said three-stage air filter apparatus, said heater being selected so as to elevate the air flowing thereacross to a temperature of greater than about 42°F and having a relative humidity of about 70%.

9. The system according to claim 1, further comprising cooling coils interposed between said output of said three-stage air filter apparatus and said input of said supply fan.

10. The system according to claim 1, wherein said first and second and third filters of said three-stage air filter apparatus are selected to remove particulates, aerosols and gas created by chemical, biological or radiological conditions.

11. A method for supplying an enclosed protected zone having air intake means with supply having an inlet and that is filtered to remove contaminants created by chemical, biological or radiological conditions, said method comprising the steps of:

a) providing a three-stage air filter apparatus having an input fluidly coupled to said inlet said three-stage air filter apparatus having a first, second and third coaxially arranged annular filters, with the first filter being disposed within the second filter and the second filter being disposed within the third filter, and with the first filter being positioned closest to said input and the third filter being positioned closest to said output, said first filter filtering and removing particulates of at least a first size, said second filter filtering and removing aerosols and particulates of a size which is less than said first size, and said third filter comprising a gas adsorber for removing gases; and

b) providing a supply fan having an input fluidly coupled to said output of said three-stage air filter apparatus and an output fluidly coupled to said air intake means of said protected zone, said supply fan supplying a sufficient flow of air so as to provide said protected zone with a positive pressure within the range from about 0.5 in wg. to about 1.5 in wg.

12. The method according to claim 11, further comprising step of arranging at least one differential transducer between the input and output of the three-stage air filter apparatus and delivering an output proportional to the difference between the pressure sensed therebetween.

13. The method according to claim 11, further comprising the step of arranging a transducer within said protected zone and delivering an output proportional to the pressure sensed therein.

14. The method according to claim 13, further comprising the step of providing an alarm device connected to receive the output of said transducer and generating an alarm signal when said output of said transducer is representative of a pressure of below about 0.5 in wg.

15. The method according to claim 11, wherein said protected zone has an opening with an input and an output and wherein said method further comprises the step of:

a) providing a pressure control valve (PCV) fluidly coupled between the input and output of said opening of said protected zone; and

b) dimensioning said PCV to allow for fluid communication between said input and output when the positive pressure within said protected zone is greater than about 1.5 wg.

16. The method according to claim 11, further comprising the step of:

a) providing a coarse filter interposed between said inlet of said supply fan and said input of said three-stage air filter apparatus, said coarse filter filtering and removing particulates having a size which is greater than said first size.

17. The system according to claim 16 further comprising the steps of:

a) providing a heater interposed between said coarse filter and said input to said three-stage air filter apparatus; and:

b) dimensioning said heater to elevate the air flowing thereacross to a temperature of greater than about 42°F and having a relative humidity of about 70%.

18. A system for supplying an enclosed protected zone with air cleaned of chemical, biological, and radiological contaminants at a flow rate sufficient to maintain a positive pressure within the protected zone, comprising:

a free-standing first filter that filters and removes particulates of at least a first size from the air;

a free-standing second filter that filters and removes aerosols and particulates of a size which is less than the first size from the air;

a free-standing third filter that adsorbs gases from the air; and

a blower pneumatically coupling the downstream side of the third filter with the protected zone,

wherein:

the first, second and third filters are annular filters axially nested one inside the other in the recited order; and

the first, second, and third filters are radial flow filters.

19. The system according to claim 18, further comprising:

a filter housing including an axial opening for receiving the first, second, and third filters, and an annular opening receiving cleaned air from the downstream side of the third filter; and a plenum pneumatically coupling the annular opening and the blower.